

**STATEMENT OF BASIS**  
**Title V Permit to Operate**  
**Permit No.: V-LL-R50002-04-01**

The purpose of this document is to set forth the legal and factual basis for the conditions in the Title V Permit to Operate. This document shall provide a brief description of the derivation of the conditions of the permit and the rationale for their inclusion, as required by 40 CFR §71.11(b).

**1.0 GENERAL INFORMATION**

**(A). Applicant and Stationary Source Information**

Permittee	Facility (SIC Code: 4922)
Great Lakes Gas Transmission Limited Partnership 5250 Corporate Drive Troy, Michigan 48908	Compressor Station No. 4 31641 Great Lakes Road Deer River, Minnesota 56636
Contact: Dorothy Fleming (248) 205-7454	Contact: Lee Hanson (218) 246-8294

**(B). Permitting Background**

In the late 1990's, the United States Environmental Protection Agency's Region 5 office (EPA) reviewed the status of sources located in Indian Country. During this review it was determined that the Great Lakes Gas Transmission Limited Partnership's (Great Lakes Gas) Compressor Station No. 4 (CS #4) was located in Indian Country and was erroneously issued both construction and operating permits by the State of Minnesota. Since Minnesota did not and currently does not have authority to issue permits to sources in Indian Country, all air quality construction and operating permit issued by the Minnesota Pollution Control Agency (MPCA) are considered invalid. EPA is issuing this Title V operating permit in accordance with 40 CFR Part 71 to correct this oversight and issue Great Lakes Gas a valid Title V operating permit.

Great Lakes Gas submitted a revised Title V permit application for CS #4 to EPA on November 15, 1999. The attached Part 71 operating permit includes the federal regulations applicable to the Facility and does not reference or incorporate any permit issued by the State of Minnesota.

Although the permits issued by MPCA are not considered valid permits, these permits have been listed below for reference and informational purposes:

- Permit No. 365E-92-0T-1 (Issued July 9, 1992) - Permit authorizing Great Lakes Gas to replace two existing smaller (7,500 hp and 7,800 hp) Orenda natural gas fired combustion turbines with one new General Electric 15,300 hp (at NEMA conditions) natural gas fired turbine. Since this replacement did not result in a significant increase in emissions (as defined by 40 CFR Part 52), the Facility was not required to perform a BACT analysis for this permit.
- Amendment No. 1 to Permit No. 365E-92-0T-1 (Issued July 12, 1993) - Amendment extending the date upon which Great Lakes Gas must certify that the existing Orenda Turbines have been removed or made physically inoperable.
- Amendment No. 2 to Permit No. 365E -92-0T-1 (Issued May 17 1994) - Incorporates a custom fuel monitoring plan for sulfur in accordance with the New Source Performance Standards (NSPS), Subpart GG.
- Title V Operating Permit No. 06100011-001 (Issued December 2, 1998)

### **(C). Facility Description**

Great Lakes Gas operates nearly 2,000 miles of large diameter underground pipeline, which transports natural gas for delivery to customers in the midwestern and northeastern United States and eastern Canada. The pipeline's 14 compressor stations, located approximately 75 miles apart, operate to keep natural gas moving through the system. Great Lakes Gas owns and operates five compressor stations in Minnesota: St. Vincent Compressor Station #1, Thief River Falls Compressor Station #2, Shevlin Compressor Station #3, Deer River Compressor Station #4, and Cloquet Compressor Station #5. Compressors operated at these stations add pressure to natural gas in the pipeline causing it to flow to the next compressor station. The pipeline normally operates continuously, but at varying load, 24 hours per day and 365 days per year.

CS #4 is located approximately 3 miles west of the city of Deer River in Itasca County, Minnesota. The facility property occupies an area of approximately 20 acres and is owned and maintained by Great Lakes Gas.

CS #4 currently consists of two stationary natural gas-fired turbines (EU-001, EU-002), which in turn drive two natural gas

compressors. Additionally, one natural gas-fired standby electrical generator (EU-003) provides electrical power for critical operations during temporary electrical power outages and during peak loading.

**(C). Area Classification**

CS #4 is located approximately 80 miles from the Wisconsin border on privately-owned fee land within the exterior boundaries of the Leech Lake Band of Chippewa Indian Reservation. The EPA is responsible for issuing and enforcing any air quality permits for the source until such time that the Tribe or State has EPA approval to do so.

The Facility is located in Itasca County, Minnesota which is designated attainment for all criteria pollutants. There are no PSD Class I areas within 100 kilometers of CS #4.

**(D). Enforcement Issues**

The EPA is not aware of any pending enforcement issues at this Facility.

**(E). Pollution Control Equipment**

None of the emission units located at CS #4 are equipped with pollution control devices.

## 2.0 PROCESS DESCRIPTION

### (A). Emission Unit Summary

Emission Unit ID	Unit Type	Fuel Type	Manufacturer/ Unit type	Maximum Design Heat Input (MMBtu/hr)	Date Installed
001	Turbine	natural gas	Avon 101G	187.2	1971
002	Turbine	natural gas	General Electric LM 1600	184.0	1993, replaced two units originally installed in 1969/70
003	Standby Electrical Generator	natural gas	Waukesha VGF 36 GL/GLD (low emission unit)	6.46	1997, replaced a unit originally installed in 1968

### (B). Insignificant Activities

Unit/Activity	Basis
Space Heaters	40 CFR 71.5(c)(11)(i)(D)
Boiler	40 CFR 71.5(c)(11)(i)(D)
Parts cleaner	40 CFR 71.5(c)(11)(ii)(A)
Welding	40 CFR 71.5(c)(11)(ii)(A)
Access road	40 CFR 71.5(c)(11)(ii)(A)

### (C). Potential Emissions

The following tables were calculated by EPA after receipt of the Part 71 application submitted in 1999, and 2000 emission testing data. Emission Factors for the turbines for NO<sub>x</sub>, CO, and VOC were calculated from performance test performed at the facility in May of 2000. The maximum ambient horsepower rating (HP) for each unit was used when calculating Potential to Emit (PTE) for

the system.

<b>Emission Factors (lb/MMbtu)</b>								
EU	Unit	PM	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	Pb	Total HAPs
001	turbine	0.0066 <sup>a</sup>	0.060 <sup>a</sup>	0.211 <sup>c</sup>	1.176 <sup>c</sup>	0.1598 <sup>c</sup>	ND	0.00103 <sup>a</sup>
002	turbine	0.0066 <sup>a</sup>	0.060 <sup>a</sup>	0.537 <sup>c</sup>	0.014 <sup>c</sup>	0.0021 <sup>a</sup>	ND	0.00103 <sup>a</sup>
003	generator	0.0483 <sup>b</sup>	0.000588 <sup>b</sup>	0.74 <sup>d</sup>	0.49 <sup>d</sup>	0.214 <sup>d</sup>	ND	0.097 <sup>b</sup>

- a From U. S. EPA AP-42, Tables 3.1-1, 3.1-2a and 3.1-3, Chapter 3.1 for stationary gas turbines, published April 2000. Percent sulfur in pipeline quality natural gas defined as 0.064% by weight (40 CFR 72.2 and gas tariff).
- b From U. S. EPA AP-42, Table 3.2-1, Chapter 3.2 for gas-fired reciprocating engines, published July 2000
- c From May 2000 performance test. Report submitted to EPA on July 24, 2000 (rev. April 17, 2001). VOC is measured as total non-methane hydrocarbons (THC), reduced by 80% to account for VOC only compounds.
- d. Based on manufacturer's information, as stated in correspondence from Great Lakes Gas to EPA on December 5, 2000.
- ND No Data

<b>Potential to Emit Summary</b>								
EU	Unit Type	PM tpy	SO <sub>2</sub> tpy	NO <sub>x</sub> tpy	CO tpy	VOC tpy	Pb tpy	Total HAPs tpy
001	turbine	5.4	49.3	173.0	964.2	131.0	ND	0.8
002	turbine	5.3	48.5	432.8	11.3	1.7	ND	0.8
003	generator	1.4	0.02	21.0	14.0	6.0	ND	2.7
Total Potential Emissions		12.1	97.8	626.8	989.5	138.7	ND	4.3

ND No Data

#### Potential To Emit (PTE) Calculations:

PTE = Emission Factor x Maximum Designed Heat Input x  
 Operational limitations

#### Example:

EU 001: 187.2 MMBtu/hr

NO<sub>x</sub>: 0.211 lb/MMbtu \* 187.2 MMBtu/hr \* 8760 hr/yr \* 0.0005  
 ton/lb = 173.00 tpy

**(D). Actual Emissions**

The following emission estimate is based data submitted by the facility for their 2003 emission estimates.

Actual Emission Summary								
EU	Unit Type	PM tpy	SO2 tpy	NOx tpy	CO tpy	VOC tpy	Pb tpy	Total HAPs tpy
001	turbine	3.3 <sup>a</sup>	0.1 <sup>a</sup>	102.7 <sup>a</sup>	583.8 <sup>b</sup>	16.5 <sup>a</sup>	0	0.5 <sup>b</sup>
002	turbine	3.4 <sup>a</sup>	0.1 <sup>a</sup>	270.7 <sup>a</sup>	7.2 <sup>b</sup>	0.00 <sup>a</sup>	0	0.5 <sup>b</sup>
003	generator	NR	NR	NR	NR	NR	NR	NR
Total Actual Emissions		6.7	0.2	373.4	591.0	16.5	0	1.0

NR No Reported

a Based on the Facility's 2002 Air Pollutant Emission Inventory for CS#4 dated November 15, 2003.

b Based on the emission factors above and throughput of natural gas reported for the 2002 Air Pollutant Emission Inventory.

**3.0 APPLICABLE REGULATIONS AND DETERMINATIONS**

**(A). Title V Operation Permitting**

In accordance with 40 CFR 71.3(a)(1), all major stationary sources are required to obtain a Title V operating permit.

"Major source" is defined in 40 CFR 71.2 as any stationary source belonging to a single major industrial grouping and that directly emits, or has the potential to emit, 100 tons per year or more of any criteria pollutant. Since CS#4 has the potential to emit greater than 100 tons per year of NO<sub>x</sub>, CO, and VOC emissions, it is considered a major stationary source and therefore subject to Title V.

**(B). New Source Performance Standards (NSPS)**

In 1993 Great Lakes Gas replaced two smaller gas turbines with one larger 23,000 hp gas turbine (EU-002) subjecting this unit to the NSPS, Subpart GG, Standards of Performance for Stationary Gas Turbines.

1. NSPS Limits for NO<sub>x</sub>

In accordance with 40 CFR Part 60.332(d), "stationary gas turbines with a manufacturer's rated base load at ISO conditions of 30 megawatts or less...shall comply with part 60.332(a)(2)."

i. EU 002 Manufacturer's rated base load:

$$23,000\text{HP} \cdot \frac{745.7\text{W}}{1\text{hp}} \cdot \frac{1\text{MW}}{10^6\text{W}} = 17.1\text{MW}$$

ii. NSPS NO<sub>x</sub> emission limit:

$$\text{STD} = 0.0150 \times \frac{14.4}{Y} + F$$

$$\text{STD} = 0.0150 \times \frac{14.4}{11.00} + 0 = 0.0196$$

STD = 196 ppm @ 15% O<sub>2</sub> and on a dry basis

Where:

STD = allowable NO<sub>x</sub> emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

$$Y = \frac{7,777.7 \text{ Btu}}{\text{HP} \cdot \text{hr}} \times \frac{1055\text{J}}{\text{Btu}} \times \frac{\text{KJ}}{1000\text{J}} \times \frac{\text{HP}}{745.7\text{W}} = 11.00 \frac{\text{KJ}}{\text{W} \cdot \text{hr}}$$

F = NO<sub>x</sub> emission allowance for fuel-bound nitrogen as defined in paragraph 40 CFR 60.332(a)(3). Since fuel bound nitrogen is less than 0.015% by weight, F equals zero.

2. NSPS SO<sub>2</sub> emission limit

Per 40 CFR Part 60.333(b), "...[No] owner or operator subject to provisions of this subpart shall burn in any

stationary gas turbine any fuel which contains sulfur in excess of 0.8% by weight...."

3. NSPS Subpart GG Custom Fuel Monitoring

On November 20, 1998, Great Lakes Gas obtained EPA approval to implement a custom fuel monitoring plan for EU 002 in accordance with 40 CFR Part 60.334(i)(3). The custom plan is used in place of the sulfur monitoring requirements contained in Part 60.334(i)(2). Under the plan, nitrogen monitoring is waived while the facility uses pipeline quality natural gas. The facility has demonstrated past compliance with the plan and is now in the stage of the plan that allows sulfur monitoring on a semi-annual basis at CS #5.

**(C). Prevention of Significant Deterioration (PSD) Permitting**

In 1993, Great Lakes Gas modified its facility by replacing two existing turbine units originally installed in 1969 and 1970 with a GE LM 1600 turbine. Great Lake Gas submitted calculations to MPCA demonstrating that the modification would not result in a significant net increase in emissions as defined by Part 52.21 and therefore was not subject to the PSD permitting requirements.